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**UNITED STATES PATENT APPLICATION  
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**VEHICLE CHARGER/FLASHLIGHT**

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## **VEHICLE CHARGER/FLASHLIGHT**

### **BACKGROUND OF THE INVENTION**

The present invention relates generally to vehicle chargers for mobile  
5 devices, and more particularly to multi-functional vehicle chargers for mobile devices.

Vehicle cigarette lighter ports provide a readily available power supply within  
a vehicle. As a result, it is convenient to charge the batteries of a mobile device  
while traveling in a vehicle. However, when driving or riding in a vehicle at night, it is  
often difficult to see well enough to efficiently connect the vehicle charger to the  
10 mobile device.

While interior vehicle lights may provide sufficient illumination to connect the  
vehicle charger to the mobile device, such light sources are often very distracting to  
the driver. Smaller light sources, such as pen-lights or other portable flashlights, may  
not be available and/or may be cumbersome to use while attempting to connect the  
15 vehicle charger to the mobile device. The present invention addresses the above  
identified problems by providing a convenient light source for providing illumination  
while connecting a vehicle charger to a mobile device.

### **SUMMARY OF THE INVENTION**

20 The present invention comprises a method and apparatus for providing  
illumination while connecting a mobile device to a vehicle charger. The vehicle  
charger includes a plug adaptable to connect to a mobile device. When electrically  
connected to a power supply, a light source disposed on the plug provides  
illumination while a user connects the vehicle charger to the mobile device. The  
25 power supply may comprise an external battery, such as a vehicle battery.  
Alternatively, the power supply may comprise an internal battery within the vehicle

charger. Further, exemplary embodiments include a switch to selectively connect the light source to the power supply.

## BRIEF DESCRIPTION OF THE DRAWINGS

5           Figure 1 illustrates an exemplary vehicle charger according to the present invention.

          Figures 2A-2D illustrate exemplary mobile device plugs for the vehicle charger of Figure 1.

          Figures 3A-3B illustrate an exemplary circuit for the vehicle charger of the  
10       present invention.

## DETAILED DESCRIPTION OF THE INVENTION

          Figure 1 illustrates an exemplary vehicle charger 100 according to the present invention. Vehicle charger 100 comprises a mobile device plug 110 and a  
15       power plug 120. A cord electrically connects mobile device plug 110 to power plug 120. Those skilled in the art will appreciate that vehicle chargers comprise a wide variety of mobile device plugs 110 and power plugs 120. As such, the present invention is not limited to the specific mobile device plug 110 or power plug 120 shown in Figure 1.

20           An exemplary mobile device plug 110 is shown in further detail in Figures 2A-2D. As shown in Figure 2A, mobile device plug 110 includes an outer housing comprising a mobile device adaptor 112, a light source 114, and optionally, a switch 116. When light source 114 is electrically connected to a power supply 310 (Figure 3A), as discussed further below, light source 114 provides a beam of light for  
25       illuminating an area proximate the mobile device plug 110. This beam of light may be used to illuminate the corresponding connector on the mobile device to facilitate connecting the mobile device to the vehicle charger in low-light environments. In

addition, the beam of light may be used to provide illumination for performing other tasks.

Light source 114 may comprise any light source known in the art, such as a white light source, a light emitting diode (LED), etc. An exemplary light source 114  
5 implemented in the vehicle charger 100 according to the present invention comprises a white or blue LED 114. LED 114 may dissipate between 50-100 mW and may provide between 425-850 mcd of luminous intensity. Typically, LED 114 dissipates approximately 70 mW and provides approximately 600 mcd of luminous intensity.

In exemplary embodiments, light source 114 connects to power supply 310  
10 via switch 116. Switch 116 may comprise a momentary contact switch 116 (Figures 2A-2C), a conventional on/off switch 116 (Figure 2D), or any other switch 116 known in the art. Exemplary momentary contact switches 116 include a push-button switch 116 (Figure 2A), a rocker switch 116 (Figure 2B), and a slide switch 116 (Figure 2C). Those skilled in the art will appreciate that other switches not shown or discussed  
15 herein are also applicable to the present invention.

Figures 3A and 3B illustrate a simple circuit 300 for the present invention. Those skilled in the art will understand that the circuit 300 of Figures 3A-3B only illustrates the basic elements of a flashlight circuit; other elements superfluous to the present invention are not shown for simplicity. Circuit 300 includes power supply 310,  
20 light source 114, resistor 320, switch 116, and ground 330. Power supply 310 provides power for at least the light source 114, and may comprise an external power supply 310, such as a vehicle power supply. As shown in Figure 1, inserting power plug 120 into a cigarette lighter port 210 in the dashboard 220 of a vehicle provides an external power supply 310 for vehicle charger 100. In this embodiment, power  
25 supply 310 provides power for driving the light source 114 and for charging the mobile device. Alternatively, vehicle charger 100 may include an internal power supply 310, separate from the charging power supply, for light source 114. For

example, an internal power supply 310 may comprise a battery disposed within mobile device plug 110.

The default state for light switch 116 is open. When switch 116 is open (Figure 3A), circuit 300 comprises an open circuit and light source 114 does not emit  
5 any light. However, when closed (Figure 3B), switch 116 completes the circuit, which allows current to flow from the power supply 310 to ground 330. Resistor 320 loads circuit 300 to provide the appropriate resistance for light source 114, as is well understood in the art. As a result, when a user activates switch 116, light source 114 provides illumination to facilitate connecting the mobile device to the vehicle charger.

10 The foregoing description and drawings describe and illustrate the present invention in detail. However, the foregoing only describes some embodiments. Accordingly, the present invention may be carried out in specific ways other than those set forth herein without departing from the essential characteristics of the invention. The present embodiments are, therefore, to be considered in all respects  
15 as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.